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(71)Applicant : SONY CORP

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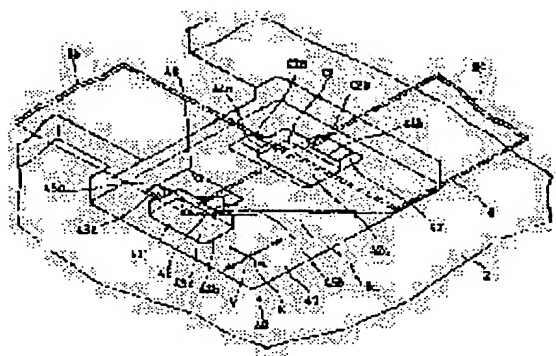
(72)Inventor : NAKAYAMA TATSUYUKI

## (54) FLEXIBLE WIRING BODY FIXING STRUCTURE FOR ELECTRONIC APPARATUS

### (57)Abstract:

**PROBLEM TO BE SOLVED:** To accurately and surely fix the bend of a flexible wiring body to a base member by providing a fixed pawl from among a pair of pawls located on the outside of the bend with a recess for receiving the part of the flexible wiring block, superposed on the surface side of the bend.

**SOLUTION:** Slits 44a, 44b are made in the base part of a fixed pawl 42, located on the inside of the bend 8a of a flexible flat cable 8. Slits 45a, 45b are made in the base part of a fixed pawl 43 located on the outside, i.e., the opposite side of the bend 8a of the flexible flat cable 8. The width of one slit 45b is set substantially equal to that of the slit 44a, 44b, while the width of the other slits 45a is set slightly narrower than that of the one slit 45b thus forming a recess 46 which is provided with a step extending in a Y-direction and having one side edge being defined by the intersection of two supporting faces 43a, 43b.



**Title:** **JP10256759A2: FLEXIBLE WIRING BODY FIXING STRUCTURE FOR ELECTRONIC APPARATUS**

**Derwent Title:** Fixing structure of flexible flat cable for electronic device e.g. CD-ROM drive - has recess for accommodating part of cable overlapping with front side of bent portion, in nail arranged at exterior of bent portion  
[Derwent Record]

**Country:** JP Japan

**Kind:** A

**Inventor:** NAKAYAMA TATSUYUKI;

**Assignee:** SONY CORP  
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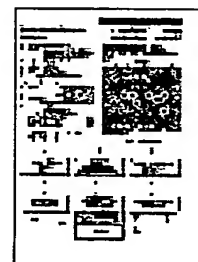
**Abstract:** PROBLEM TO BE SOLVED: To accurately and surely fix the bend of a flexible wiring body to a base member by providing a fixed pawl from among a pair of pawls located on the outside of the bend with a recess for receiving the part of the flexible wiring block, superposed on the surface side of the bend.

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(71)出願人 000002185

ソニー株式会社

東京都品川区北品川6丁目7番35号

(72)発明者 中山 立幸

東京都品川区北品川6丁目7番35号 ソニ

ー株式会社内

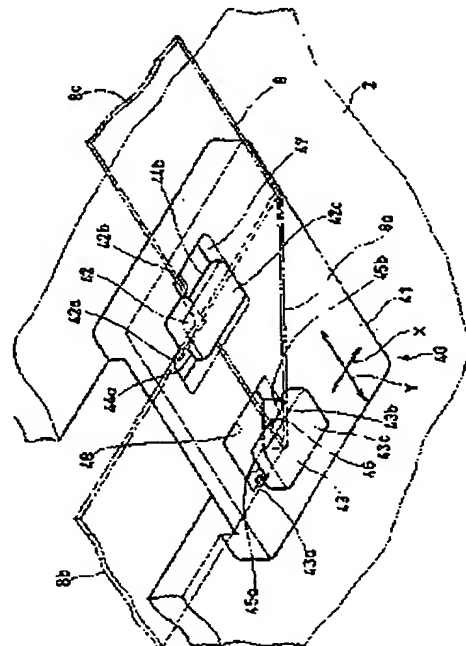
(74)代理人 弁理士 松隈 秀盛

(54)【発明の名称】 電子機器のフレキシブル配線体固定構造

(57)【要約】

【課題】 フレキシブル配線体を固定する2つの固定爪の一方で折曲部の表側に重なった部分を引っ掛けて固定し、フレキシブル配線体の固定側に対する位置精度が高く、折曲部をベース部材に確実に固定できるようにする。

【解決手段】 一対の固定爪42、43のうちフレキシブルフラットケーブル8の折曲部8aの外側に配置される外固定爪43には、折曲部8の表側に重なった部分を収容する凹部46を設ける。





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ケーブル 8 は、2つの固定爪 12、13 の 4つの支持面 12a、12b、13a、13b によって 4面支持されている。

【0009】また、従来のフレキシブル配線体固定構造の第2例の場合には、図21～図23に示すような状態でシャーシ 2 の裏面に固定されている。このシャーシ 2 の裏面に設けられたケーブル固定部 15 には、上記2つの固定爪 12、13 に加えて第3の補助固定爪 16 が設けられている。この補助固定爪 16 は、スリットを左右方向へ通過させることによって設けられた 1つの支持面 16a を有し、この支持面 16a によって FF ケーブル 8 の他端側 8c の外側の辺が支持されている。

【0010】かくして、この第2例のフレキシブル配線体固定構造の場合には、FF ケーブル 8 の内外固定爪 12、13 に対する上述した支持状態に加えて、FF ケーブル 8 の折り曲げによって外側に移動した辺が補助固定爪 16 の支持面 16a に接触している。従って、この場合の FF ケーブル 8 は、3つの固定爪 12、13、16 の 5つの支持面 12a、12b、13a、13b、16a によって 5面支持されている。

【0011】

【発明が解決しようとする課題】しかしながら、このような従来の電子機器のフレキシブル配線体固定構造においては、4面支持された前者の場合には、FF ケーブル 8 の折曲部 8a の内側及び外側のそれぞれ 2 辺を、左右に配置された一対の固定爪 12、13 のそれぞれ 2つの支持面 12a、12b 及び 13a、13b の合計 4 辺で支持して固定する構造となっていた。そのため、内固定爪 12 の支持面 12a、12b の頂点を支点として FF ケーブル 8 にぐらつきが生じ易く、固定側としてのシャーシ 2 に対する折曲部 8a の位置精度が不安定なものになっているという課題があった。

【0012】このような位置精度の不安定性を改善するためになされた 5面支持による後者の場合には、内固定爪 12 に対向させるように 3つ目の補助固定爪 16 を設ける構造となっていたため、補助固定爪 16 を設けるためのスペースが必要となり、シャーシ 2 が大きくなって装置の大型化を招くという課題があった。更に、内外固定爪 12、13 に FF ケーブル 8 の折曲部 8a を装着した後、3つ目の固定爪 16 に FF ケーブル 8 の他端側 8c を引っ掛けて固定する必要があることから、組立作業が難しく作業時間が長くなるという課題もあった。

【0013】本発明は、このような従来の課題に鑑みてなされたものであり、フレキシブル配線体を固定する 2つの固定爪の一方で折曲部の表側に重なった部分を引っ掛けて固定できるようにすることにより、フレキシブル配線体の固定位置の精度が高く、折曲部をベース部材側に確実に固定することができる電子機器のフレキシブル配線体固定構造を提供することを目的としている。

【0014】

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【課題を解決するための手段】本発明は、上述したような課題等を解決し、上記目的を達成するために、電子部品と電源側部品とを電気的に接続するフレキシブル配線体を長手方向の中途部で折り曲げて折曲部を形成し、この折曲部の内側及び外側に配設される一対の固定爪をベース部材に設け、一対の固定爪で両側から折曲部を保持してフレキシブル配線体をベース部材に固定するようにした電子機器のフレキシブル配線体固定構造において、一対の固定爪のうち折曲部の外側に配置される固定爪に、フレキシブル配線体の折曲部の表側に重なった部分を収容する凹部を設けたことを特徴としている。

【0015】本発明は、上述のように構成したことにより、フレキシブル配線体の折曲部をベース部材に精度良く確実に固定できると共に、固定側であるベース部材の小型化を図ることができ、更に、組立作業が簡単であって作業に長時間を要することもない。

【0016】

【発明の実施の形態】以下、本発明の実施の形態を添付図面を参照して説明する。図1～図13は本発明の一実施例を示すもので、図1～図10は本発明の電子機器のフレキシブル配線体固定構造を示す斜視図、底面図、正面図、平面図、側面図及びそれぞれ断面図、図11～図13は本発明の電子機器のフレキシブル配線体固定構造が用いられた CD-ROM ドライブ装置を示す斜視図、底面図及び正面図である。尚、これらの図において、図14～図23で示した従来例と同一部分には同一符号を付して説明する。

【0017】本実施例のフレキシブル配線体固定構造は、電子機器の一具体例を示す CD-ROM ドライブ装置 1 に適用したものである。この CD-ROM ドライブ装置 1 は、情報記録ディスクとして読出し専用の CD-ROM が用いられるもので、図11～図13に示すように、ベース部材の一具体例を示すシャーシ 2 と、このシャーシ 2 に搭載されるスピンドルモータ 21 と光学ピックアップ装置 6 等を備えている。

【0018】シャーシ 2 は、合成樹脂材によって形成された板状のフレーム部材からなり、このシャーシ 2 の四隅には、図示しないマウントインシュレータが装着されるインシュレータ取付部 20 が設けられている。このインシュレータ取付部 20 に装着されるマウントインシュレータを介してシャーシ 2 が、ディスク再生装置等のメインシャーシに弾性的に支持される。このシャーシ 2 には、一部を下方へ膨出させることによって上面に開口させた凹陥部 3 が設けられている。この凹陥部 3 内にはスピンドルモータ 21 が収容され、スピンドル軸を上方へ向けた状態でシャーシ 2 に複数本の固定ねじによって締付固定されている。

【0019】このスピンドルモータ 21 のスピンドル軸にはターンテーブル 4 が取り付けられており、このターンテーブル 4 に情報記録ディスクが装着される。このタ

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ーンテーブル4の上方には、図示しないチャッキングプレートが配設され、このチャッキングプレートで情報記録ディスクをターンテーブル4側に押圧することにより、情報記録ディスクがターンテーブル4にチャッキングされて一体的に回転駆動される。

【0020】更に、シャーン2の凹陥部3内には、光学ピックアップ装置6がターンテーブル4に対して接近・離反可能に配設されている。この光学ピックアップ装置6は、情報記録ディスクの情報記録面に対面して情報信号を読み取るヘッド部としてのピックアップ部6aと、このピックアップ部6aを搭載してシャーン2にスライド移動可能に支持されたスライド本体6b等を備えている。この光学ピックアップ装置6のスライド本体6bには、半導体レーザ、対物レンズその他のレンズ、光検出器等が取り付けられている。

【0021】この光学ピックアップ装置6は電子部品の一具体例を示すもので、その端子が電気接続されたプリント基板にはFF（フレキシブルフラット）ケーブル8の一端が接続されている。このFFケーブル8は、フレキシブル配線体の一具体例を示すもので、この他にもフレキシブルプリント基板（FPC）、その他の帯状あるいはリボン状の配線ケーブルを用いることができる。

【0022】この光学ピックアップ装置6に関連してシャーン2には、情報記録ディスクの半径方向にスライド本体6bをスライド移動させるためのラックピニオン式の送り機構30が設けられている。この送り機構30は、シャーン2に固定される駆動源としての送りモータ31と、互いに平行に設けられ且つスライド本体6bを揺動可能に支持する2本のガイド軸32a、32bと、スライド本体6bに一体的に設けられたラック部材33と、送りモータ31の回転力をラック部材33に伝達して光学ピックアップ装置6を移動させる送りギア列34等を備えている。

【0023】送り機構30の2本のガイド軸32a、32bは、凹陥部3の幅方向両側において長手方向に延在させて設けられており、これらのガイド軸32a、32bには、スライド本体6bの両端に設けられた軸受部35が揺動可能に係合されている。ラック部材33は、それらの歯がガイド軸32aと平行に延びるように設けられていて、シャーン2に回転自在に支持された駆動ギア34aが噛合されている。この駆動ギア34aには、同じくシャーン2に回転自在に支持された中間ギア34bの小歯車と噛合されており、この小歯車と一体の大歯車には、送りモータ31の回転軸に取り付けられた出力ギアが噛合されている。この出力ギアと中間ギア34bの大小歯車と駆動ギア34aとによって送りギア列34が構成されている。

【0024】かくして、送りモータ31を駆動してその回転力を送りギア列34からラック部材33に伝達することにより、送りモータ31の回転方向に応じてスライ

ド本体6bが、ターンテーブル4に対して接近し、又は離反するように移動する。これにより、ターンテーブル4にチャッキングされて回転駆動される情報記録ディスクの半径方向に光学ピックアップ装置6がスライド移動して、スライド本体6bに搭載されたピックアップ部6aによる情報信号の読取りが行われる。

【0025】この送り機構30の送りモータ31の端子が電気接続されたプリント基板には、FFケーブル9aの一端が接続されている。また、スピンドルモータ21の端子が電気接続されたプリント基板には、FFケーブル9bの一端が接続されている。そして、これらFFケーブル9a、9bの他端側はシャーン2の底面側に引き回され、その底面に設けられた穴から裏面側に引き出されている。

【0026】また、光学ピックアップ装置6に一端が接続されたFFケーブル8の他端側は、シャーン2の底面側に引き出されたところで90°に折り曲げられ、この折曲部8aから先端側が他のFFケーブル9a、9bと平行となるように配線されている。そして、このFFケーブル8は、図12及び図1～図10に示すような状態で折曲部8aをケーブル固定部40に係合支持することにより、シャーン2の裏面に着脱可能に支持固定されている。

【0027】このケーブル固定部40は、シャーン2の裏面に一体に設けられており、四角形に彫出されたテーブル状の台座41と、この台座41に設けられた左右一対の固定爪42、43とを有している。

【0028】一対の固定爪42、43のうち、FFケーブル8の折曲部8aの折り曲げ側である内側に配置される内固定爪42の基部（台座41側）には、2つの固定爪42、43を結ぶ方向（Y方向）とこれに直交する方向（X方向）とに延びるスリット44a、44bが設けられている。これらのスリット44a、44bによって内固定爪42には、空間側に270°の角度を開いて隣合う2つの支持面42a、42bと、これらの支持面42a、42b側に底のように突出された爪部42cとが設けられている。これらスリット44a、44bの幅は、FFケーブル8の折曲部8aの厚みよりも若干広く設定されている。

【0029】また、FFケーブル8の折曲部8aの反折り曲げ側である外側に配置される外固定爪43の基部には、X方向に延びるスリット45aと、このスリット45aが延びる方向に対して角度135°で交差する方向に延びるスリット45bとが設けられている。これらのスリット45a、45bによって外固定爪43には、空間側に135°の角度を開いて隣合う2つの支持面43a、43bと、これらの支持面43a、43b側に底のように突出された爪部43cとが設けられている。

【0030】これらスリット45a、45bのうち、一方のスリット45bの幅は、スリット44a、44bの

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【0035】このような折曲部8aの固定状態において、FFケーブル8の一端側8bに、図2においてX方向に向かう外力 $F_x$ が作用したものとする。この場合、FFケーブル8の一端側8bに外力 $F_x$ を作用させて引っ張ると、折曲部8aのY方向に延びる内側の辺が内固定爪42の支持面42bと、外固定爪43の凹部46の面とに引っ掛かり、これらの支持面42b及び凹部46によって一端側8bに作用する外力 $F_x$ が受けられる。

【0037】次に、折曲部8aの同様の固定状態において、FFケーブル8の他端側8cに、図2においてY方向に向かう外力Fyが作用したものとする。この場合には、FFケーブル8の他端側8cに外力Fyを作用させて引っ張ると、折曲部8aのX方向に延びる内側の辺が内固定爪42の支持面42aに引っ掛かると共に、同じく内側の辺が外固定爪43の凹部46の段部に引っ掛かる。そして、これらの支持面42a、特に凹部46の段部によって他端側8cに作用する外力Fyが受けられるため、折曲部8aがぐらつくことなく固定される。従って、このように外力Fyが作用した場合にも、折曲部8aを動かないようにしてケーブル固定部40からの折曲部8aの抜け出しを防止し、位置精度を安定性良く維持することができる。

【0038】以上説明したが、本発明は上記実施例に限定されるものではなく、例えば、上記実施例においては、本発明に係るフレキシブル配線体構造を情報記録ディスクとして再生専用のCD-ROMを用いたCD-ROMドライブ装置の光学ピックアップ装置のフレキシブルフラットケーブルに適用した例について説明したが、送りモータ31用のFFケーブル9aやスピンドルモータ21用のFFケーブル9b等に適用することができることは勿論である。更に、CD-ROMドライブ装置の他にも、CD（コンパクトディスク）プレーヤ装置、LD（レーザディスク）プレーヤ装置、DVD（デジタルビデオディスク）ドライブ装置等は勿論のこと、一度だけ書けるライトワンス型や何度でも再書き込みが可能なリライタブル型の光磁気ディスク等を用いるCD-R（レコーダブル）レコーダ装置、MD（ミニディスク）ドライブ装置、MO（光磁気記録）ドライブ装置、HD（ハードディスク）ドライブ装置その他各種の電子装置に適用することができる。

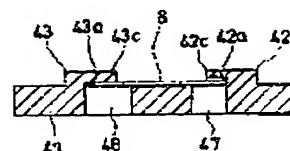
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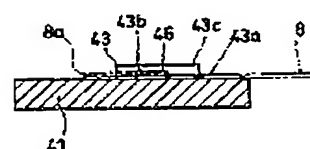


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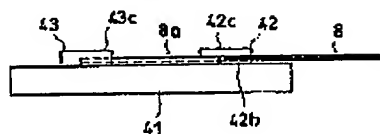
【图6】



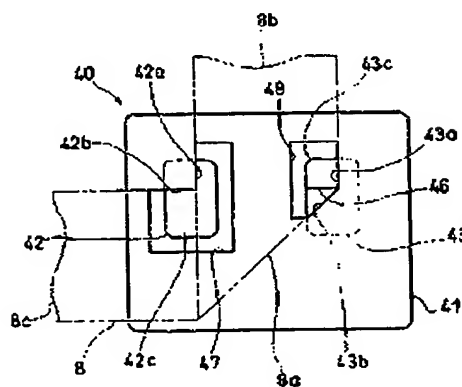
【图9】



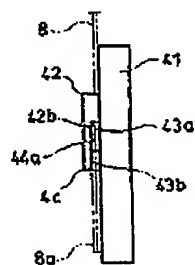
【图2】



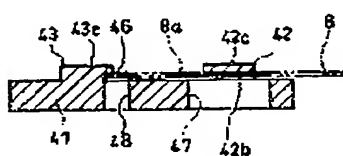
【圖4】



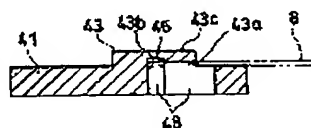
【例5】



【圖 7】



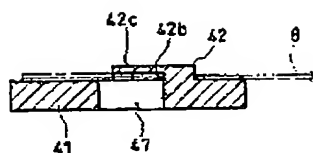
【圖8】



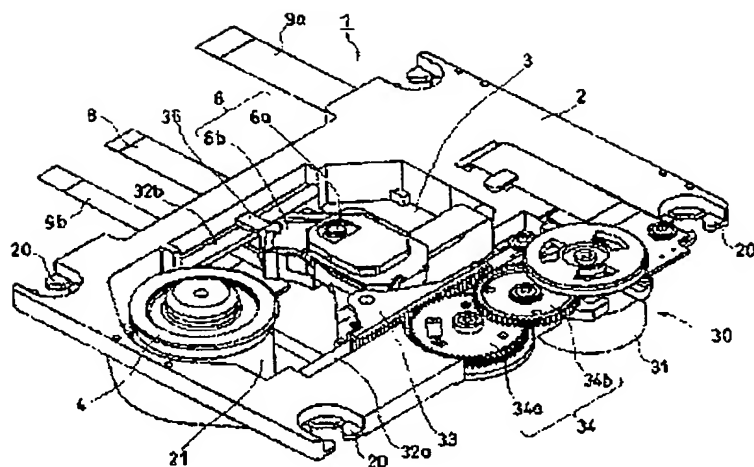
(8)

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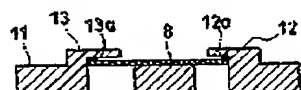
【図10】



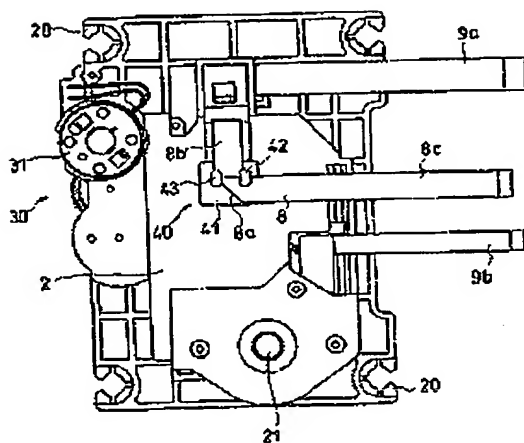
【図11】



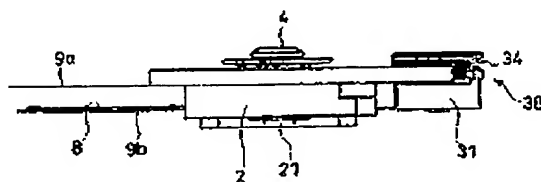
【図18】



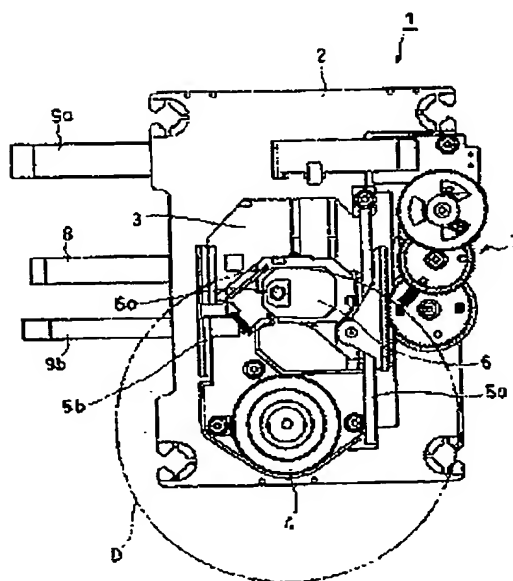
【図12】



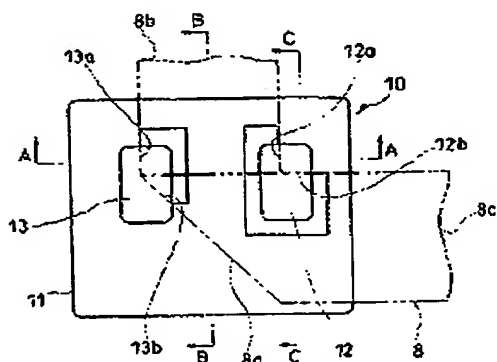
【図13】



【図14】

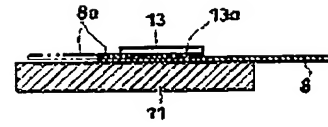


【図16】

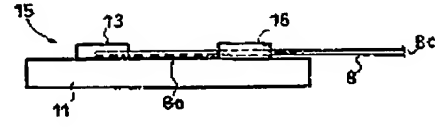


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【圖 19】



【图22】



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DETAILED DESCRIPTION

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[Detailed Description of the Invention]

[0001]

[The technical field to which invention belongs] This invention relates to the flexible wiring object fixed structure of the electronic equipment for fixing the bending section of a flexible wiring object to a base member especially about the electronic equipment of the CD-ROM drive equipment which connects electronic parts and a power supply flank article electrically using flexible wiring objects, such as a flexible flat cable (FFC) and a flexible printed circuit board (FPC), and others.

[0002]

[Description of the Prior Art] As flexible wiring object fixed structure of this kind of conventional electronic equipment, the thing as shown in drawing 14 - drawing 23 is known, for example. Drawing 14 is the plan showing the CD-ROM drive equipment 1 which has a general configuration, drawing 15 - drawing 20 show the 1st example of the conventional flexible wiring object fixed structure, and drawing 21 - drawing 23 show the 2nd example of the conventional flexible wiring object fixed structure.

[0003] This CD-ROM drive equipment 1 is equipped with the chassis 2, and in the cavity 3 prepared in the upper surface of this chassis 2, where a spindle shaft is turned upwards, the spindle motor is attached. The turntable 4 is attached in the upper limit section of the spindle shaft of this spindle motor, chucking of the CD-ROM (compact disk-read-only memory) is carried out to this turntable 4 as an information record disk D, and playback actuation is presented. Furthermore, in the cavity 3 of a chassis 2, the optical pickup 6 to which both ends were guided is arranged possible [ approach and estrangement ] to the turntable 4 with two guide shafts 5a and 5b which are mutually parallel.

[0004] Slide migration of this optical pickup 6 is carried out in the inside of a cavity 3 by the delivery device 7 in which it has a motor, the gear of two or more sheets, and a rack member, and reading of an information signal is performed by head section 6a which made the objective lens face the information recording surface of the information record disk D at the time of that migration. The information signal read by this head section 6a is changed into an electrical signal by the optical pickup 6, and is taken out from the flexible flat cable (henceforth "FF cable") 8 by which the end was connected to this optical pickup 6 out of drive equipment. In this drawing, 9a is an FF cable which connects a motor [ of the delivery device 7 ], and power supply side, and 9b is an FF cable which connects a spindle motor [ of a disk rolling mechanism ], and power supply side.

[0005] This FF cable 8 is bent by 90 degrees in the halfway section of a longitudinal direction, and bending section 8a is being fixed to the rear face of a chassis 2 in the condition that it is shown at drawing 15 - drawing 20 in the case of the 1st example of the conventional flexible wiring object fixed structure. The cable fixed part 10 for fixing the FF cable 8 is formed in the rear face of this chassis 2. This cable fixed part 10 has the plinth 11 of the shape of a table by which swelling was carried out to the quadrangle, and the fixed pawls 12 and 13 of a left Uichi pair formed in this plinth 11.

[0006] It is formed in the base of the internal-fixation pawl 12 arranged inside bending section 8a of the FF cable 8 among the fixed pawls 12 and 13 of a pair by making two slits cross a right angle, and the angle of 270 degrees is opened and the back faces 12a and 12b of two \*\*\*\*\* are formed in the space side. Moreover, it is formed in the base of the external-fixation pawl 13 arranged on the outside of bending section 8a of the FF cable 8 by making two slits cross at the angle of 135 degrees, and the angle of 135 degrees is opened and the back faces 13a and 13b of two \*\*\*\*\* are formed in the space side.

[0007] In this way, where the side which lapped by bending is made into a side front, it is equipped with bending section 8a bent by 90 degrees of the FF cable 8 between the fixed pawl 12 of a pair, and 13. At this time, two sides of that inside are contacted by the internal-fixation pawl 12, and two sides of that outside are contacted to bending section 8a of the FF cable 8 by the external-fixation pawl 13.

[0008] That is, in end side of bending section 8a of FF cable 8 8b, the inside side contacts back-face 12a of the internal-fixation pawl 12, and the lateral side touches back-face 13a of the external-fixation pawl 13. And in other

end side of FF cable 8 8c, the side which the location was reversed by bending section 8a and changed inside contacts back-face 12b of the internal-fixation pawl 12, and the lateral side touches back-face 13b of the external-fixation pawl 13. Therefore, the 4th page of the FF cable 8 is supported by four back faces 12a, 12b, 13a, and 13b of two fixed pawls 12 and 13.

[0009] Moreover, it is fixed to the rear face of a chassis 2 in the condition that it is shown at drawing 21 - drawing 23 in the case of the 2nd example of the conventional flexible wiring object fixed structure. In addition to the two above-mentioned fixed pawls 12 and 13, the 3rd auxiliary fixed pawl 16 is formed in the cable fixed part 15 prepared in the rear face of this chassis 2. This auxiliary fixed pawl 16 has one back-face 16a prepared by passing a slit to a longitudinal direction, and the side of the outside of other end side 8c of the FF cable 8 is supported by this back-face 16a.

[0010] In this way, in the case of this flexible wiring object fixed structure of the 2nd example, in addition to the support condition over the inside-and-outside fixed pawls 12 and 13 of the FF cable 8 mentioned above, the side where it moved outside by bending of the FF cable 8 touches back-face 16a of the auxiliary fixed pawl 16. Therefore, the 5th page of the FF cable 8 in this case is supported by five back faces 12a, 12b, 13a, 13b, and 16a of three fixed pawls 12, 13, and 16.

[0011]

[Problem(s) to be Solved by the Invention] However, in the case of the former supported the 4th page, in the flexible wiring object fixed structure of such conventional electronic equipment, it had become the structure of the fixed pawls 12 and 13 of the pair of the inside of bending section 8a of the FF cable 8, and an outside arranged at right and left supported and fixed by a total of four sides of two back faces 12a and 12b, and 13a and 13b, respectively about two sides, respectively. Therefore, it was easy to produce a totter on the FF cable 8 by having used the top-most vertices of the back faces 12a and 12b of the internal-fixation pawl 12 as the supporting point, and the technical problem that the location precision of bending section 8a to the chassis 2 as a fixed side was unstable occurred.

[0012] Since it had become the structure of forming the 3rd auxiliary fixed pawl 16 so that the internal-fixation pawl 12 might be made to counter, in the case of the latter by the 5th page support made in order to improve the instability of such a location precision, the space for forming the auxiliary fixed pawl 16 was needed, and there was a technical problem that a chassis 2 became large and enlargement of equipment was caused in it. Furthermore, since other end side 8c of the FF cable 8 needed to be hooked on the 3rd fixed pawl 16 and it needed to fix to it after equipping the inside-and-outside fixed pawls 12 and 13 with bending section 8a of the FF cable 8, the technical problem that it was difficult and working hours became long also had assembly operation.

[0013] By be make in view of such a conventional technical problem, hook the portion which lapped with the side front of the bending section, and enable it to fix by one side of two fixed pawls which fix a flexible wiring object, the precision of this invention of the fixed position of a flexible wiring object be high, and it aim at offer the flexible wiring object fixed structure of the electronic equipment which can certainly fix the bending section to a base member side.

[0014]

[Means for Solving the Problem] In order for this invention to solve a technical problem which was mentioned above and to attain the above-mentioned purpose Bend a flexible wiring object which connects electronic parts and a power supply flank article electrically in the halfway section of a longitudinal direction, and the bending section is formed. In flexible wiring object fixed structure of electronic equipment which forms a fixed pawl of a pair arranged in the inside and an outside of this bending section in a base member, holds the bending section from both sides by fixed pawl of a pair, and fixed a flexible wiring object to a base member It is characterized by preparing a crevice which holds a portion which lapped with a side front of the bending section of a flexible wiring object in a fixed pawl arranged among fixed pawls of a pair on the outside of the bending section.

[0015] This invention can attain a miniaturization of a base member which is a fixed side, it is still easier assembly operation and an activity does not take a long time to it while it can certainly fix the bending section of a flexible wiring object to a base member with a sufficient precision by having constituted as mentioned above.

[0016]

[Embodiment of the Invention] Hereafter, the gestalt of operation of this invention is explained with reference to an accompanying drawing. Drawing 1 - drawing 13 show one example of this invention, and a cross section, drawing 11 - drawing 13 of drawing 1 - drawing 10 are the perspective diagrams, the bottom plan views, and front view showing the perspective diagram showing the flexible wiring object fixed structure of the electronic equipment of this invention, a bottom plan view, front view, a plan, a side elevation, and the CD-ROM drive equipment with which the flexible wiring object fixed structure of the electronic equipment of this invention was used, respectively. In addition, the same sign is attached and explained to the same portion as the conventional example shown by drawing 14 - drawing 23 in these drawings.

[0017] The flexible wiring object fixed structure of this example is applied to the CD-ROM drive equipment 1 in which one example of electronic equipment is shown. CD-ROM read-only as an information record disk is used, and this CD-ROM drive equipment 1 is equipped with the chassis 2 which shows one example of a base member, the spindle motor 21 carried in this chassis 2, and the optical pickup 6 grade as shown in drawing 11 - drawing 13.

[0018] A chassis 2 consists of a tabular frame member formed of synthetic-resin material, and the insulator attachment section 20 equipped with the mounting insulator which is not illustrated is formed in the four corners of this chassis 2. A chassis 2 is elastically supported by the Main chassis, such as a disk regenerative apparatus, through the mounting insulator with which this insulator attachment section 20 is equipped. The cavity 3 made [ the upper surface ] to carry out a opening is formed in this chassis 2 by carrying out swelling of the part to a lower part. A spindle motor 21 is held in this cavity 3, and where a spindle shaft is turned upwards, it is being fixed to the chassis 2 by two or more lockscrews with the bundle.

[0019] The turntable 4 is attached in the spindle shaft of this spindle motor 21, and this turntable 4 is equipped with an information record disk. By arranging the chucking plate which is not illustrated above this turntable 4, and pressing an information record disk to a turntable 4 side on this chucking plate, chucking of the information record disk is carried out to a turntable 4, and a rotation drive is carried out in one.

[0020] Furthermore, in the cavity 3 of a chassis 2, the optical pickup 6 is arranged possible [ approach and estrangement ] to the turntable 4. pickup section 6a as the head section which this optical pickup 6 meets the information recording surface of an information record disk, and reads an information signal, and this pickup section 6a -- carrying -- a chassis 2 -- a slide -- it has slide main part 6b supported movable. The lens of semiconductor laser, and an objective lens and others, the photodetector, etc. are attached in slide main part 6b of this optical pickup 6.

[0021] This optical pickup 6 shows one example of electronic parts, and the end of the FF (flexible flat) cable 8 is connected to the printed circuit board to which electrical connection of that terminal was carried out. This FF cable 8 can show one example of a flexible wiring object, and the distribution cable of the shape of band-like [ of a flexible printed circuit board (FPC) and others ] or a ribbon can be used for it.

[0022] In relation to this optical pickup 6, the delivery device 30 of the rack-and-pinion type for making radial [ of an information record disk ] carry out slide migration of the slide main part 6b is formed in the chassis 2. This delivery device 30 is equipped with the delivery gear train 34 grade to which it is mutually prepared in parallel with the delivery motor 31 as a driving source fixed to a chassis 2, and the turning effort of the delivery motor 31 is delivered two guide shafts 32a and 32b which support slide main part 6b possible [ sliding ], and the rack member 33 prepared in slide main part 6b in one to the rack member 33, and the optical pickup 6 is moved.

[0023] Two guide shafts 32a and 32b of the delivery device 30 make a longitudinal direction extend in the crosswise both sides of a cavity 3, and are established, and the bearing 35 prepared in the both ends of slide main part 6b is engaging with these guide shafts 32a and 32b possible [ sliding ]. The rack member 33 is formed so that those gear teeth may be prolonged in parallel with guide shaft 32a, and drive gear 34a supported by the chassis 2 free [ rotation ] has geared. In this drive gear 34a, the pinion of middle gear 34b supported it is the same and free [ rotation on a chassis 2 ] meshes, and the output gear attached in the axis of rotation of the delivery motor 31 meshes to this pinion and the main wheel of one. The delivery gear train 34 is constituted by this output gear, the size gear of middle gear 34b, and drive gear 34a.

[0024] By driving the delivery motor 31 and transmitting the turning effort to the rack member 33 from the delivery gear train 34 in this way, according to the hand of cut of the delivery motor 31, slide main part 6b approaches to a turntable 4, or it moves so that it may desert. Thereby, chucking is carried out to a turntable 4, the optical pickup 6 carries out slide migration radial [ of the information record disk by which a rotation drive is carried out ], and read of the information signal by pickup section 6a carried in slide main part 6b is performed.

[0025] The end of FF cable 9a is connected to the printed circuit board to which electrical connection of the terminal of the delivery motor 31 of this delivery device 30 was carried out. Moreover, the end of FF cable 9b is connected to the printed circuit board to which electrical connection of the terminal of a spindle motor 21 was carried out. And the other end side of these FF cables 9a and 9b is taken about at the base side of a chassis 2, and is pulled out at the rear-face side from the hole established in the base.

[0026] Moreover, the other end side of the FF cable 8 by which the end was connected to the optical pickup 6 is bent by 90 degrees in the place pulled out at the base side of a chassis 2, and it is wired so that a tip side may become parallel to other FF cables 9a and 9b from this bending section 8a. And support immobilization of this FF cable 8 is carried out removable at the rear face of a chassis 2 by carrying out engagement support of the bending section 8a at the cable fixed part 40 in the condition that it is shown in drawing 12 and drawing 1 - drawing 10.

[0027] This cable fixed part 40 is formed in the rear face of a chassis 2 at one, and has the plinth 41 of the shape of a table by which swelling was carried out to the quadrangle, and the fixed pawls 42 and 43 of a left Uichi pair

formed in this plinth 41.

[0028] The slits 44a and 44b prolonged in the direction (the direction of Y) to which two fixed pawls 42 and 43 are connected, and the direction (the direction of X) which intersects perpendicularly with this are formed in the base (plinth 41 side) of the internal-fixation pawl 42 arranged at the inside which is a bending section 8a's of FF cable 8 bending side among the fixed pawls 42 and 43 of a pair. By these slits 44a and 44b, the angle of 270 degrees is opened to a space side, and the back faces 42a and 42b of two \*\*\*\*\*, and these back-faces 42a and claw part 42c projected like eaves at the 42b side are prepared in the internal-fixation pawl 42. The width of face of these slits 44a and 44b is widely set up a little rather than the thickness of bending section 8a of the FF cable 8.

[0029] Moreover, slit 45b prolonged in the direction which crosses at the angle of 135 degrees to the direction where slit 45a prolonged in the direction of X and this slit 45a are prolonged is prepared in the base of the external-fixation pawl 43 arranged on the outside which is a bending section 8a's of FF cable 8 anti-bending side. By these slits 45a and 45b, the angle of 135 degrees is opened to a space side, and the back faces 43a and 43b of two \*\*\*\*\*, and these back-faces 43a and claw part 43c projected like eaves at the 43b side are prepared in the external-fixation pawl 43.

[0030] The width of face of one slit 45b is set up among these slits 45a and 45b to the same extent as the width of face of Slits 44a and 44b. On the other hand, the width of face of slit 45a of another side is narrowly formed a little rather than the width of face of one slit 45b, and, thereby, forms the crevice 46 which has the step prolonged in the direction of Y considering the line by which two back faces 43a and 43b cross as one side edge. The portion which lapped with the side front of bending section 8a formed of bending of the FF cable 8 engages with this crevice 46. The step of this crevice 46 is making the 5th back face prepared in the external-fixation pawl 43 arranged outside. In addition, 47 and 48 which are shown in drawing 2 etc. are the hole for shaping prepared in order to fabricate the fixed pawls 42 and 43.

[0031] The activity which attaches bending section 8a of the FF cable 8 to the cable fixed part 40 which has such a configuration can be done easily as follows, for example. First, as a dashed line shows drawing 2, the side of the outside of bending section 8a of the FF cable 8 is made parallel with the direction of X, and a part for the intersection inside bending section 8a is inserted in claw part 42c of the internal-fixation pawl 42. As the crevice between claw part 42c of the internal-fixation pawl 42 is shown in drawing 3, drawing 7, etc. at this time, although it is the comparatively thin slot formed of Slits 44a and 44b, it can carry out easily by inserting bending section 8a from across.

[0032] Next, a counterclockwise rotation T is made to rotate the whole FF cable 8 in drawing 2 focusing on the inside of bending section 8a, and bending section 8a is inserted in the bottom of claw part 43c of the external-fixation pawl 43. As the crevice between claw part 43c of the external-fixation pawl 43 is shown in drawing 6, drawing 8, etc. at this time, although it is the very thin slot formed of slit 45a, since the rotation direction of the FF cable 8 is parallel to the extension direction of slit 45a, it can insert very easily.

[0033] And if it enters deeply in narrow slit 45a, and bending section 8a of the FF cable 8 passes through the inside of this slit 45a and enters into the broad slit 45b side, the portion which lapped by bending of bending section 8a will engage with a crevice 46. Consequently, the FF cable 8 carries out rotation displacement of the angle of 45 degrees, and changes from the condition shown with a dashed line in drawing 2 to the condition which shows with a two-dot chain line. Thereby, immobilization of bending section 8a of the FF cable 8 to the cable fixed part 40 of a chassis 2 is completed.

[0034] In this way, where the side which lapped by bending is made into a side front, it is equipped with bending section 8a bent by 90 degrees of the FF cable 8 between the fixed pawl 42 of a pair, and 43, and it is fixed by five back faces 42a, 42b, 43a, 43b, and 46 of these fixed pawls 42 and 43. That is, this FF cable 8 engages with a crevice 46 while two sides of an outside are contacted by the back faces 4a and 42b of the external-fixation pawl 43 by two sides inside bending section 8a being contacted by the back faces 42a and 42b of the internal-fixation pawl 42, and it is contacted by the step. Thereby, bending section 8a of the FF cable 8 can certainly be fixed, and the instability of the location precision by fluctuation of a fixed position can be abolished.

[0035] In the fixed condition of such bending section 8a, the external force  $F_x$  which goes to end side 8b of the FF cable 8 in the direction of X in drawing 2 should act. In this case, if external force  $F_x$  is made to act on end side 8b of the FF cable 8 and it pulls, the side of the inside prolonged in the direction of Y of bending section 8a is caught in back-face 42b of the internal-fixation pawl 42, and the field of the crevice 46 of the external-fixation pawl 43, and the external force  $F_x$  which acts on end side 8b by these back-faces 42b and the crevice 46 can receive.

[0036] Thus, in order that the side of the crosswise both sides of the FF cable 8 may engage with the fixed pawls 42 and 43 on either side and may prevent migration of bending section 8a to the external force  $F_x$  of the direction of X, it is fixed, without being shaky to both the fixed pawls 42 and 43. Therefore, the ejection of bending section



8a from the cable fixed part 40 is prevented, and location precision can be maintained with sufficient stability. [0037] Next, in the same fixed condition of bending section 8a, the external force  $F_y$  which goes to other end side 8c of the FF cable 8 in the direction of Y in drawing 2 should act. In this case, if external force  $F_y$  is made to act on other end side 8c of the FF cable 8 and it pulls, while the side of the inside prolonged in the direction of X of bending section 8a will be caught in back-face 42a of the internal-fixation pawl 42, similarly the inside side is caught in the step of the crevice 46 of the external-fixation pawl 43. And since these back-faces 42a and the external force  $F_y$  which acts on other end side 8c especially by the step of a crevice 46 can receive, it is fixed, without bending section 8a being shaky. Therefore, also when external force  $F_y$  acts in this way, as bending section 8a cannot be moved, the ejection of bending section 8a from the cable fixed part 40 can be prevented, and location precision can be maintained with sufficient stability.

[0038] Although the example which this invention is not limited to the above-mentioned example, used flexible wiring object structure concerning this invention as the information record disk in the above-mentioned example, and was applied to the flexible flat cable of the optical pickup of the CD-ROM drive equipment using CD-ROM only for playbacks although explained above was explained, of course, it is applicable to FF cable 9a for delivery motor 31, FF cable 9b for spindle motor 21, etc. Furthermore, it is applicable to the electronic instrument of CD-R (recorder bull) recorder equipment [ using the rewritable type magneto-optic disk in which a rewrite is possible ], MD (mini disc) Tribe equipment, MO (magneto-optic recording) drive equipment, HD (hard disk) Tribe equipment, and others various kinds besides CD-ROM drive equipment the write-once mold which can be written only at once, and any number of times not to mention CD (compact disk) player equipment, LD (laser disk) player equipment, DVD (digital video disc) drive equipment, etc.

[0039] Moreover, in the above-mentioned example, although the example which set the angle of bend of the FF cable 8 as 90 degrees was explained, it is not limited to this angle and can be set as the angle of arbitration like 45 degrees, 60 degrees, 105 degrees, and 135 degrees. Furthermore, the configuration of the inside-and-outside fixed pawls 42 and 43 is not limited to the quadrangle shown in this example, and can apply circular, a hexagon, and various kinds of other configurations. And the same is said of the quality of the material of the inside-and-outside fixed pawls 42 and 43, sheet metal, the ceramics, and others can be applied not to mention synthetic resin, and it is not limited especially about a process, either.

[0040] Furthermore, the depth of the crevice 46 established in the external-fixation pawl 43 can be suitably set up also about the width of face of Slits 44a, 44b, 45a, and 45b that what is necessary is just what is engaged and can carry out support immobilization of the portion which lapped by bending of bending section 8a. Thus, this invention can be variously changed in the range which does not deviate from the meaning.

[0041]

[Effect of the Invention] As explained above, according to this invention, it writes as the structure of preparing the crevice which holds the portion which lapped with the side front of the bending section of a flexible wiring object in the fixed pawl arranged on the outside of the bending section. The bending section of a flexible wiring object can certainly be fixed to a base member, as it cannot move, the instability of the location precision by fluctuation of a fixed position can be abolished, and the location precision over a fixed side can be raised by leaps and bounds.

[0042] And since the 3rd fixed pawl for improving the instability of location precision like before is not needed, while being able to prevent structure becoming complicated, the miniaturization of fixed sides, such as a part, a base member, etc. which do not need the space for the 3rd fixed pawl, can be attained. Furthermore, since a flexible wiring object is hooked on two fixed pawls and it only fixes, the immobilization can be performed very easily and the effect that the activity does not take time amount can be acquired.

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CLAIMS

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[Claim(s)]

[Claim 1] Bend a flexible wiring object which connects electronic parts and a power supply flank article electrically in the halfway section of a longitudinal direction, and the bending section is formed. A fixed pawl of a pair arranged in the inside and an outside of the above-mentioned bending section is formed in a base member. In flexible wiring object fixed structure of electronic equipment which holds the bending section from both sides by fixed pawl of a up Norikazu pair, and fixed a flexible wiring object to a base member Flexible wiring object fixed structure of electronic equipment characterized by preparing a crevice which holds a portion which lapped with a side front of the bending section of the above-mentioned flexible wiring object in a fixed pawl arranged among fixed pawls of a up Norikazu pair on the outside of the above-mentioned bending section.

[Claim 2] Flexible wiring object fixed structure of electronic equipment characterized by providing or including the following Internal-fixation pawls arranged inside among fixed pawls of a up Norikazu pair in flexible wiring object fixed structure of electronic equipment according to claim 1 are two back faces in alignment with ulnar margin of the bending section of the above-mentioned flexible wiring object. External-fixation pawls arranged outside are two back faces in alignment with radial border of the bending section of the above-mentioned flexible wiring object. It is the above-mentioned crevice to a side with which a flexible wiring object lapped bordering on top-most vertices of two back faces of the above-mentioned external-fixation pawl.

[Claim 3] It is the flexible wiring object fixed structure of electronic equipment characterized by the above-mentioned flexible wiring object being a flexible flat cable or a flexible printed circuit board in flexible wiring object fixed structure of electronic equipment according to claim 1.

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DESCRIPTION OF DRAWINGS

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## [Brief Description of the Drawings]

[Drawing 1] It is the perspective diagram in which showing one example of the flexible wiring object fixed structure of the electronic equipment concerning this invention, and expanding and showing the cable fixed part of drawing 12 .

[Drawing 2] It is the bottom plan view of the cable fixed part shown in drawing 1 .

[Drawing 3] It is the front view of the cable fixed part shown in drawing 1 .

[Drawing 4] It is the plan of the cable fixed part shown in drawing 1 .

[Drawing 5] It is the side elevation of the cable fixed part shown in drawing 1 .

[Drawing 6] It is the A-A line cross section of the cable fixed part shown in drawing 2 .

[Drawing 7] It is the B-B line cross section of the cable fixed part shown in drawing 2 .

[Drawing 8] It is the C-C line cross section of the cable fixed part shown in drawing 2 .

[Drawing 9] It is D-D line cross section of the cable fixed part shown in drawing 2 .

[Drawing 10] It is the E-E line cross section of the cable fixed part shown in drawing 2 .

[Drawing 11] It is the perspective diagram showing the CD-ROM drive equipment with which the flexible wiring object fixed structure of the electronic equipment concerning this invention was used.

[Drawing 12] It is the bottom plan view of the CD-ROM drive equipment shown in drawing 11 .

[Drawing 13] It is the front view of the CD-ROM drive equipment shown in drawing 11 .

[Drawing 14] It is the plan showing conventional CD-ROM drive equipment.

[Drawing 15] It is the perspective diagram showing the 1st example of the flexible wiring object fixed structure of the conventional electronic equipment.

[Drawing 16] It is the bottom plan view of the cable fixed part shown in drawing 15 .

[Drawing 17] It is the front view of the cable fixed part shown in drawing 15 .

[Drawing 18] It is the A-A line cross section of the cable fixed part shown in drawing 16 .

[Drawing 19] It is the B-B line cross section of the cable fixed part shown in drawing 16 .

[Drawing 20] It is the C-C line cross section of the cable fixed part shown in drawing 16 .

[Drawing 21] It is the bottom plan view showing the 2nd example of the flexible wiring object fixed structure of the conventional electronic equipment.

[Drawing 22] It is the front view of the cable fixed part shown in drawing 21 .

[Drawing 23] It is the A-A line cross section of the cable fixed part shown in drawing 21 .

## [Description of Notations]

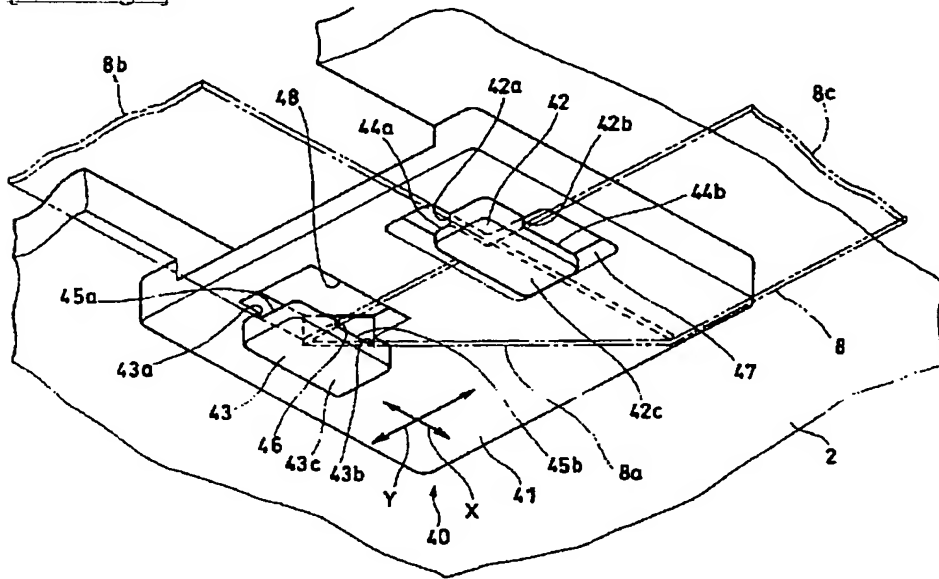
1 CD-ROM Drive Equipment (Electronic Equipment) 2 Chassis (Base Member), 6 Optical pickup (electronic parts) 8 Flexible flat cable (flexible wiring object), 8a Bending section 8b End side 8c Other end side 40 Cable fixed part, 41 Plinth 42 An internal-fixation pawl (fixed pawl), 43 External-fixation pawl (fixed pawl) 42a, 42b, 43a, 43b Back face 42c, 43c Claw part 44a, 44b, 45a, 45b Slit 46 crevices

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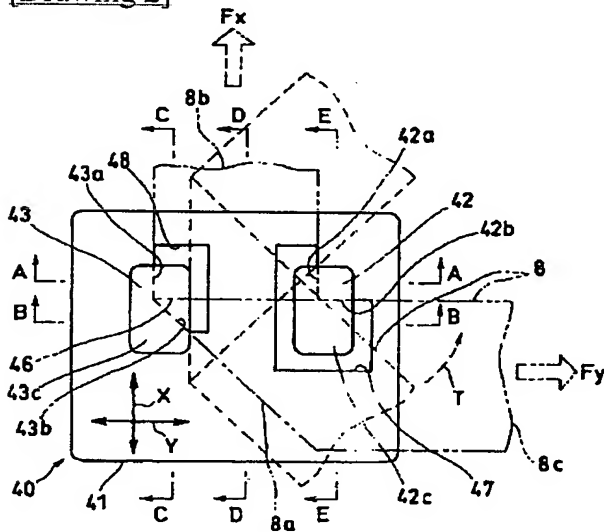
[Translation done.]

- 1.This document has been translated by computer. So the translation may not reflect the original precisely.
- 2.\*\*\*\* shows the word which can not be translated.
- 3.In the drawings, any words are not translated.

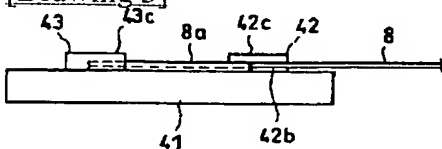
[Drawing 1]



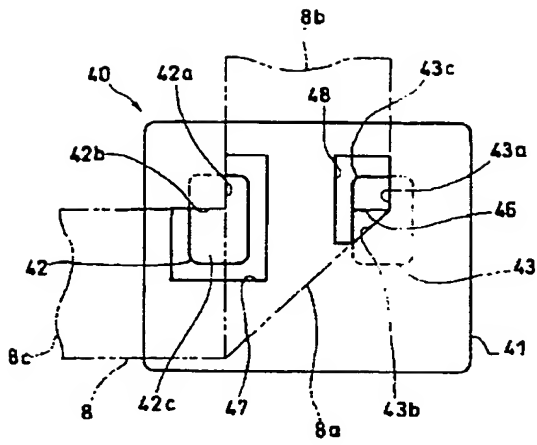
[Drawing 2]



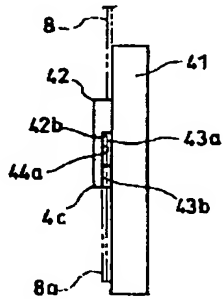
[Drawing\_3]



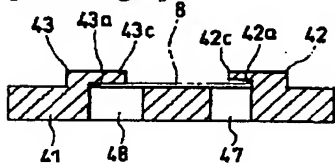
[Drawing 4]



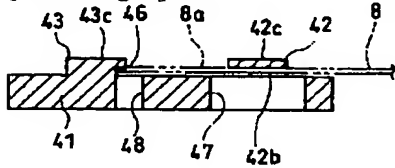
[Drawing 5]



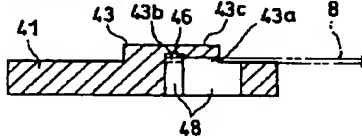
[Drawing 6]



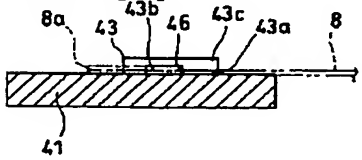
[Drawing 7]



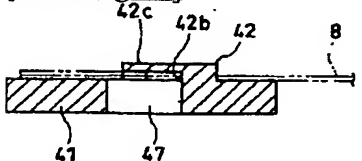
[Drawing 8]



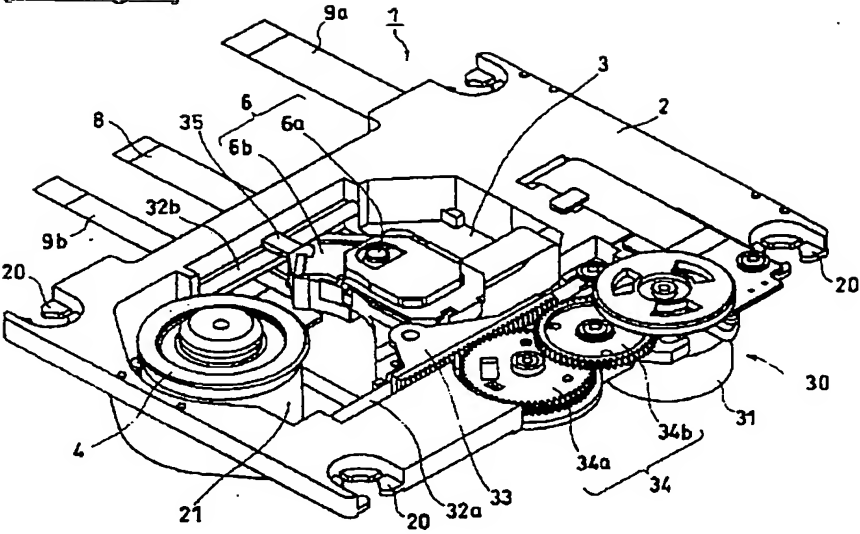
[Drawing 9]



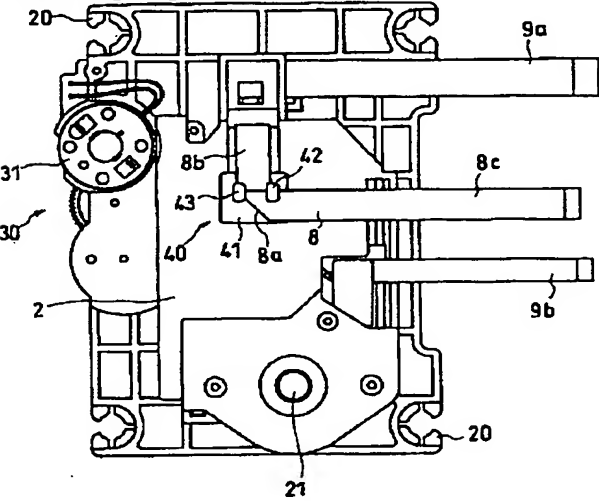
[Drawing 10]



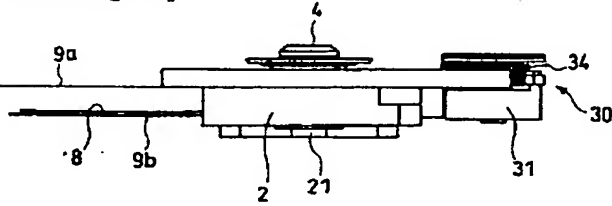
[Drawing 11]



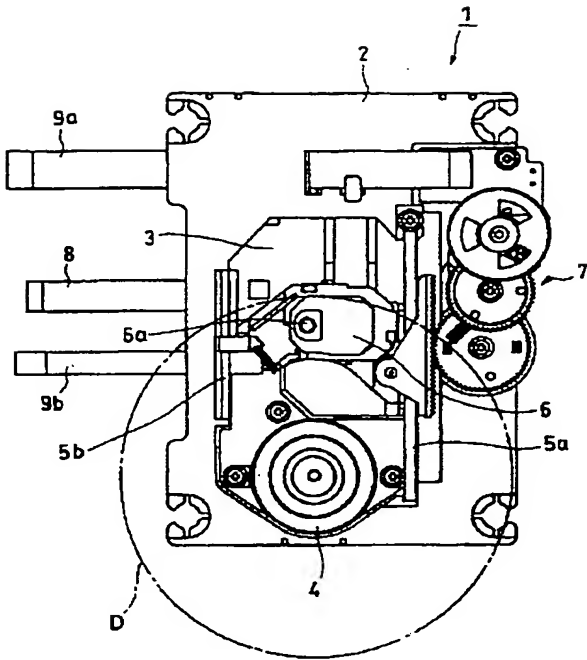
[Drawing 12]



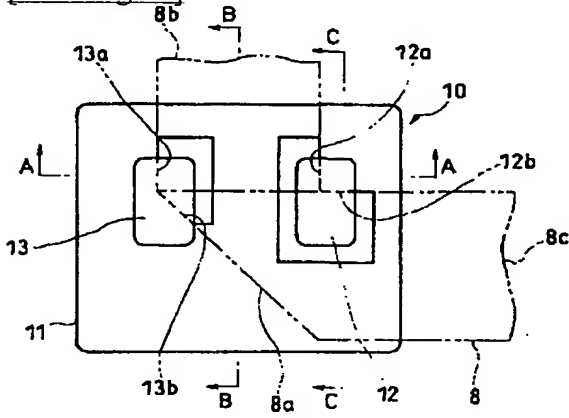
[Drawing 13]



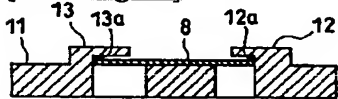
[Drawing 14]



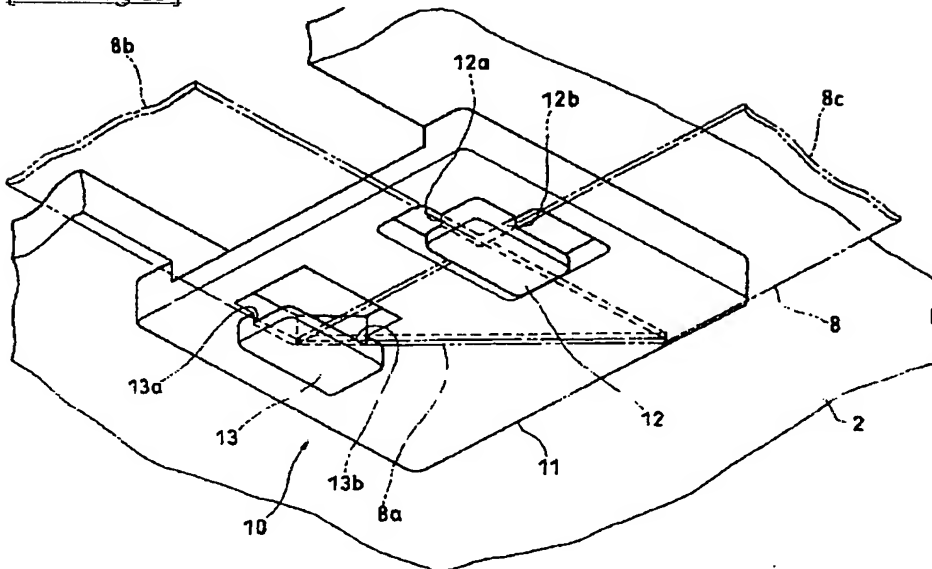
[Drawing 16]



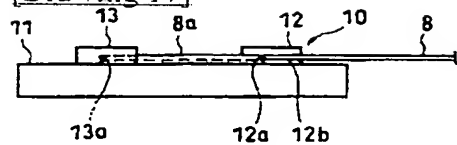
[Drawing 18]



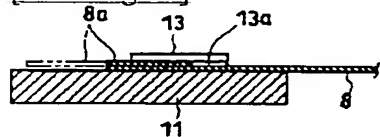
[Drawing 15]



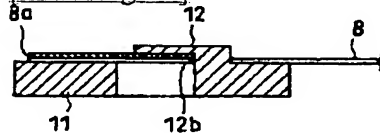
[Drawing 17]



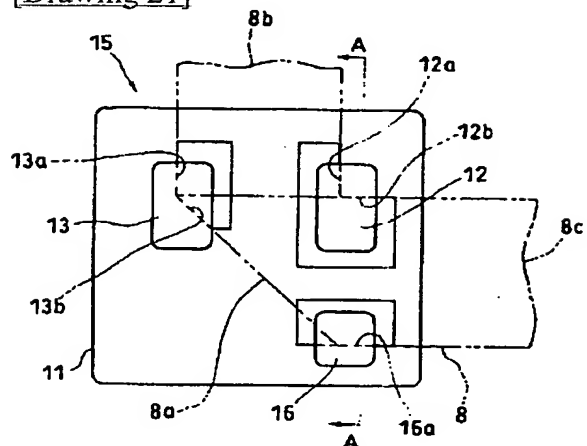
[Drawing 19]



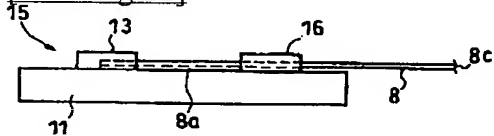
[Drawing 20]



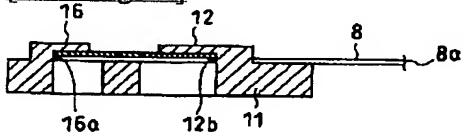
[Drawing 21]



[Drawing 22]



[Drawing 23]



[Translation done.]